XXX EURO mini Conference
"Optimization in the Natural Sciences"

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Aveiro, Portugal

PROGRAM

gradient predictor—corrector tracking combined path following interior point algorithm. The global linear convergence of the algorithm is proved under the normal cone condition for the feasible region. For its numerical tests some strategies are used and indicate that the algorithm is efficient.

■ FC-03

Friday, 11:30 - 13:00
Room 11.1.12

Graph theory and applications 2

Stream: Optimization and Applications
Contributed session
Chair: *Paula Carvalho*, University of Aveiro, Portugal,
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1 - How to solve the maximum matching problem determining (0,2)-regular sets

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Domingos Cardoso, Carlos J. Luz

A (k,t)-regular set in a graph is a subset of vertices such that each vertex in the set has k neighbours in it and each vertex not in the set has exactly t neighbours in it. We present a new algorithm for obtaining $(0,2)$-regular sets in line graphs and also its application to the determination of maximum matchings in arbitrary graphs.

2 - A recursive determination of regular exceptional graphs by (k,t)-extensions

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Domingos Cardoso, Paula Rama

In this talk, we propose to construct arbitrary families of regular graphs, by determining a regular graph from another one using a (k,t)-extension. This new recursive technique is used to construct the regular exceptional graphs and we show that it induces a partial order relation. The (k,t) — extension procedure is reduced to the construction of the incidence matrix of a combinatorial 1-design, considering several rules to prevent the production of isomorphic graphs. Finally, an algorithm based on this recursive construction and the Hasse diagram of the poset is also presented.

3 - The modified Schultz index of tricyclic graphs

Paula Rama, Department of Mathematics, University
of Aveiro, Universidade de Aveiro - Departamento
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The topological indices are graph invariants much studied in both mathematical and chemical literature. In this talk, we present several results on the modified Schultz index, in particular, we determine a lower bound of the modified Schultz

Finding the most important or central group of nodes in a graph has been studied for a long time in social network analysis. An important group centrality measure is the group betweenness centrality (gbc) which is defined (for a group of nodes) as the fraction of the shortest paths between the nodes of a graph that pass through at least one of the nodes in the group. We introduce upper and lower bounds for gbc that are easier to compute than the ones in the literature and show how these bounds could be employed to find the group (of a given size) with the highest betweenness centrality.